1852

From the Society

RESOLUTIONS

OF THE

Associated Architects.

K Academies &c.
Association of Architects

RESOLUTIONS

OF THE

Aſſociated Architects,

WITH THE

REPORT OF A COMMITTEE

BY THEM APPOINTED

To conſider the Cauſes of the frequent

FIRES,

AND THE BEST MEANS OF

PREVENTING THE LIKE IN FUTURE.

33

MVSEVM
BRITAN
NICVM

INTRODUCTION.

EARLY in the laſt year the Aſſociation of Architects in London, conſiſting of the following Profeſſors:—Robert Brettingham, Joſeph Bonomi, John Carr, Sir William Chambers, Samuel Pepys Cockerell, George Dance, Thomas Hardwick, Henry Holland, Richard Jupp, James Lewis, Robert Mylne, James Payne, Nicholas Rivett, Thomas Sandby, John Soane, James Wyatt, John Yenn, Eſquires; took into conſideration the cauſes of the frequent Fires within the limit of the Act of the 14th of Geo. III. ch. 73, for the further and better regulation of Buildings, and Party

Walls, &c. &c. and the beſt means that can be adopted for preventing the like in future.

In order that this ſubject might meet with the full and ample inveſtigation that its importance required, a Committee of the whole Aſſociation was appointed, with full powers as to expence, and every other means of enquiry and information. The attention with which this Object has been purſued by the Committee has been indefatigable, and has been rewarded with complete ſucceſs.

The Committee early ſaw and reſolved, " That as good Party Walls are the means of confining a Fire to one Houſe, ſo other practicable and not expenſive means might be deviſed, which

which will confine a Fire to one room in a houſe." Impreſſed with a ſenſe of this truth, they proceeded to enquire how this important object might moſt effectually be attained; and as ſeveral excellent methods have been propoſed by very able and ingenious men, little remained for the Committee to do, but to aſcertain their reſpective merits, and the beſt manner of applying them. With this view they procured two ſtreet houſes, and directed them to be finiſhed for habitation; and on theſe houſes, ſecured in ſuch a manner as ſeemed beſt calculated to elucidate their theory, a variety of experiments have been made, highly ſucceſsful in their progreſs, and ſatisfactory in their reſult.

The proceedings of the Committee, and the courſe of Experiments, have

been reported to the Aſſociation, who have confirmed the report, and ordered it to be printed, with the hope that it may be the means of introducing into general uſe, a practice, from which Society would derive the moſt material advantages. Yet all new propoſals are regarded with an eye of prejudice, and there is little reaſon to expect the attainment of this deſirable end without the interference and ſanction of Parliament. The aſſertions of individuals, however well grounded and ſatisfactorily maintained, can never procure that confidence, which would readily and cheerfully be granted to the authority of the Legiſlature.

About twenty years ago, the alarming frequency of Fires rouſed the public attention, and produced the preſent Building

Building Act; and this Act, had the goodneſs of its execution equalled that of the deſign, would have precluded the neceſſity of the preſent conſiderations: but its notorious obſcurity and inſufficiency calls loudly for its repeal, and the eſtabliſhment of another on principles of more general utility, and couched in terms leſs liable to miſinterpretation.

The numerous conflagrations, which alarm this metropolis, are no doubt produced in great meaſure by accident, and an improper method of conſtructing Buildings; but a very conſiderable and perhaps the greater part of them owe their exiſtence to the deſtructive hand of the Incendiary. And on this ſubject, the Committee has obſerved, with very ſerious regret, that the Inſurance Offices,

Offices, though in many inſtances a very valuable inſtitution for this country, have frequently proved a very fatal one, and have been principally inſtrumental in producing the evil, the diſaſtrous conſequences of which they were deſigned to alleviate. The convenience of exchanging uſeleſs or ruinous buildings for a ſum of money, which equals or perhaps exceeds their original value, the promptneſs of payment, and the difficulty of detection, are very powerful temptations, and have by many been found irreſiſtible. Perhaps the wiſdom of the Legiſlature may deviſe ſome meaſure, by which the ill effects of this Inſtitution may be obviated, at the ſame time that all its advantages are retained.

Theſe are the objects, to which the preſent conſiderations of the Committee have

have been directed, and ſurely theſe are objects worthy of the attention of Parliament. A Bill, formed upon theſe principles, and according to the ſuggeſtions of Profeſſional men, may effectually prevent the dreadful prevalency of Fires: and what greater ſervice can be rendered to Society, than reſtraining the power of an Element, which operates as ſo fatal an enemy to its repoſe? Without ſuch aſſiſtance, nothing is to be expected but a continuance of the evil: we muſt expect to ſee more of our public and private buildings deſtroyed; more of our Manufactories, with their valuable ſtores, reduced to aſhes; more uſeful and innocent lives loſt to Society, or individuals ruined and made miſerable; and more Incendiaries ſwelling the melancholy liſt of our public executions, and receiving

puniſhment

punishment for the commission of crimes, the original source of which is to be found in the want of a Law, which shall prevent the guilt by removing the temptation.

London,
July 26, 1793.

RESO-

RESOLUTIONS

OF THE

Aſſociated Architects.

AT a meeting of the Society, *London, February* 2d, 1792, Reſolved, That a Committee of the whole Club be appointed to conſider the cauſes of the frequent Fires within the limits of the Act of the 14th Geo. ch. 78, for the further and better regulation of Buildings and Party Walls, &c. &c. and the beſt means that can be adopted for preventing the like in future.

January 3d, 1793.

RECEIVED the Report of the Committee appointed to conſider the cauſes of the frequent Fires, and the beſt means of preventing the like in future; and Ordered, that the ſame be entered in the Minutes of the Aſſociation.

March 7th, 1793.

RESOLVED, That the Report of the Committee appointed to conſider the cauſes of the frequent Fires, and the beſt means of preventing the like in future, be printed; and that Mr. Holland be deſired to procure the ſame to be done.

REPORT

REPORT

OF the Committee of the whole Society of Architects, appointed at a general Meeting on *Friday, March* 1ſt, 1792, to conſider the Cauſes of the frequent Fires within the Limits of the Act of the 14th of the King entitled, "An Act for the further and better Regulation of Buildings, Party Walls, &c. &c." and the beſt means of preventing the like in future.

THE Committee having at ſeveral Meetings taken into conſideration the important ſubject referred to them, and having formed ſeveral unanimous opi-

nions and reſolutions, beg leave to ſubmit the ſame to the General Meeting.

The Committee conſidered, Firſt, the Cauſes of the frequent Fires: Secondly, the beſt Methods of preventing the like in future: Thirdly, the means by which ſuch preventions may be brought into general uſe.

I. With reſpect to the firſt of theſe objects of their conſideration; The Committee are of opinion, that the frequency of Fires is to be attributed to the following circumſtances, viz.

1. The preſent mode of Inſuring Buildings, Furniture, and Stock in Trade. The practice of the Fire Offices is, to pay the ſum inſured on the houſe, or to rebuild; although the ſum ſo paid,

paid, or the Building ſo re-conſtructed, may be very conſiderably ſuperior in value to the Building deſtroyed: hence a temptation is held out to Incendiaries, to inſure very old dilapidated Buildings, for large ſums, and ſet them on fire, in order to obtain for a ſmall premium, a large ſum of money or a new houſe. The recompence for the damage done to furniture and ſtock in trade, depends on the affidavit of the Inſurer, which is often violated, and about which the Offices are not ſo ſtrict as they might be, conceiving that they promote their buſineſs, by leſſening the trouble attendant on the recovery of loſſes.

2. The injudicious manner in which Stoves, Grates, Coppers, and Furnaces are frequently fixed.

3. The

3. The free, conſtant, and uncontrouled paſſage of air behind the wainſcot Linings and Battenings in almoſt all Buildings as uſually conſtructed, and the eaſy acceſs of Fire from ſtory to ſtory, through the floors and up the uſual wooden ſtair-caſes, which accelerates the progreſs of Fires from whatever accident they begin, and is the great means of rendering Buildings combuſtible.

The Committee beg leave to obſerve, that a careful enquiry authoriſes them to ſay, that Fires are more frequent and deſtructive in London, than in any other city in Europe, although the ſupplies of water and fire-engines are more numerous and excellent in London, than any where elſe.

II. In

II. In order to determine, ſecondly, on the beſt means of preventing the frequent Fires:—1ſt. The Committee have conſidered the method of prevention, propoſed by David Hartley, Eſq; as ſet forth in an Act of the 17th of the King, for veſting in him and his heirs the means of prevention, deſcribed in the following terms:—"My invention of "ſecuring Buildings and Ships againſt "the calamities of Fire, is deſcribed in "the manner following, i. e. by the ap-"plication of Plates of Metal and Wire, "varniſhed or unvarniſhed, to the ſe-"veral parts of Buildings or Ships, ſo "as to prevent the acceſs of Fire, and "current of air; ſecuring the ſeveral "joints by doubling, over-lapping, ſol-"dering, rivetting, or in any other "manner cloſing them up; nailing, "ſcrewing, ſewing, or in any other

"manner

" manner faſtening the ſaid plates of " metal into, and about the ſeveral " parts of Buildings and Ships, as the " caſe may require."

2. Alſo the ingenious method of Prevention, propoſed by Lord Stanhope, in a Paper read to the Royal Society, July 2d, 1773. (For a Copy of which, ſee the Appendix, No. I.)

3. Alſo the method of Prevention, propoſed by Mr. Henry Wood, deſcribed by him in a letter read to the Committee, dated April 7th, 1792, of which the following is a Copy :—

SIR,

" I have made ſeveral " experiments on a method of pre-

" venting

" venting Fires, and have met with ſo
" much ſucceſs as to induce me to re-
" queſt you would ſubmit it to the con-
" ſideration of the Committee of Archi-
" tects; the principle of the Invention
" is, to apply a Covering in a liquid
" ſtate to all Timbers uſed in a Build-
" ing; to Backs and Elbows, and to
" Laths, Boarding, &c. which cover-
" ing, when dry, becomes ſolid, and
" renders the wood incombuſtible (a
" pattern is herewith ſent), whereby
" the prevention will be complete.
" The covering is of ſimple, common,
" and cheap materials, eaſy in its ap-
" plication, requires little or no expe-
" rience, and will not injure or im-
" pede the progreſs of the moſt delicate
" workmanſhip. There is reaſon to
" believe it will preſerve the woodwork
" to which it is applied from decay,

" by dry rot or otherwiſe. Should this " object be thought worth the attention " of the Committee, and any further " information or aſſiſtance be thought " neceſſary or uſeful from me, I re- " queſt the favour of you, Sir, to lay " my humble ſervices at their com- " mands.

" I am, Sir, &c. &c.

" HENRY WOOD.

" *Sloane Square,*
" *April 27th*, 1792."

4. Alſo ſeveral deſultory, but ſome ingenious, Methods of prevention, deſcribed in an anonymous Pamphlet, publiſhed in 1775, by J. SOUTHERN, St. James's Street, entitled, " Various " Methods to prevent Fires in Houſes " and Shipping, and for preſerving the " Lives of People at Fires; approved

" by

" by the Society of Arts, Manufactures " and Commerce;" to which Pamphlet the Committee beg leave to refer.

5. Alſo the Act of the 14th of the King for the further and better regulation of Buildings, &c.

And the Committee further engaged two Carcaſes or Skeletons of Street Houſes, and directed the fitting of them up, ſo as to enable them to make ſeveral ſtrong and ſatisfactory Experiments, (for an account of which, ſee Appendix, No. 2) as well from the Methods deſcribed by others, as from ſuch as occurred to the Committee themſelves.

From a due inveſtigation of theſe ſeveral Methods propoſed, and of the Experiments tried, and alſo from re-

flecting on the cauſes which are principally inſtrumental in accelerating the progreſs of Fires, the Committee have been enabled to draw the following concluſions:

That as good Party Walls are the means of confining a Fire to one houſe, ſo other practicable and not expenſive means will confine a Fire to one room in a houſe *: but buildings, in which hazardous trades are carried on, require particular preventions and regulations.

That

* As all flame catches and exiſts only on the ſurface of inflammable bodies, we are hence led to invent Methods of caſing, or otherwiſe defending the Woodwork of Ships and Buildings from accidents by Fire.

Chem^l. Lect^s. by Peter Shaw, M.D. F.R.S. 1751. *Lec.* 2. 5. *Ax.* 7.

The diſtribution of theſe Plans are intended to be generally applicable to Houſes of Timber, as well as to

That the great principle of prevention is to ſtop the progreſs and circulation of the Air in all the parts of a Building

to thoſe of Brick or Stone; ſo that the exterior Walls may be of either of thoſe materials, and of any competent ſubſtance, diverſified with breaks or receſſes, at the pleaſure of the Builder, without his being under the neceſſity of making any change in the internal parts whatſoever. Further it is preſumed, Quarter Partitions, properly executed, are ſtronger, leſs expenſive, and occupy leſs room than ſuch Walls; and as Dwellings of this diminutive character ſhould poſſeſs a capability of as great a variety of compartition as poſſible in the ſeveral ſtories, to admit of the neceſſary conveniences, this kind of Partition will allow every thing that can reaſonably be deſired in that reſpect, which walls by no means do:—Add to which, that as a judicious application of *Lord Mahon*'s cheap and valuable invention will moſt aſſuredly ſecure them from being deſtroyed, or even eſſentially damaged by Fire †, no objection can be valid againſt their general uſe in Buildings of the ſame extent here treated of.

† Whenever the Legiſlature ſhall think proper to enforce the general uſe of this excellent contrivance in all future Buildings, the preſent Building Act may be repealed, and conſigned to that oblivion it moſt juſtly merits:—In any future Act, it would however be eſſential, that the abſurd cuſtom of Building upon breaſt ſummer fronts of timber-work, ſhould be univerſally reſtrained; and, inſtead thereof, wherever a ſimilar mode of conſtruction is neceſſary, the ſuperincumbent Wall ſhould

Building concealed from the eye; *i. e.* not to ſuffer Air to paſs behind Wainſcot Linings or Battening, or in the thickneſs of the Floors, which may be done ſafely and by various means, without the leaſt injury to the health of the inhabitants. On the contrary, the ill effects of the wind, which frequently finds its way through cracks and crevices, will be entirely obviated—Nor is there any reaſon to apprehend dry rot from any of the methods which have been mentioned, when properly applied; and all harbour for vermin will be deſtroyed.

ſhould be erected upon Iron Cradles, bent into regular curves, which ſhould be ſecured at their baſis or ſpringings by proper tyes and abutments, and be ſupported by iron ſtandards; the whole to be of wrought and even-faggotted iron, but by no means of caſt iron. The longer this regulation is neglected, the greater number of uſeful and valuable lives are in danger of periſhing by Fire, or by the effects of Fire, as too many recent inſtances have moſt deplorably ſhewn.

Extracted from a Pamphlet, entitled "ΟΙΚΙΔΙΑ, *or* NUTSHELLS," *page* 2, *publiſhed in London, in* 1785.

That

That the means of prevention, deſcribed by Mr. Hartley and Lord Stanhope, are effectual; that by Mr. Wood, leſs ſo, but very ſerviceable at the back of all Wainſcot Lining, &c.

That Mr. Hartley's Plates are in their application much leſs liable to injury than Lord Stanhope's Method; which, as it is neceſſary that it ſhould be quite dry before the boards are laid, muſt be guarded from accident during that time. But, if Lord Stanhope's method is ſtrengthened by a guaige of Plaiſter or Quick Lime, there will be little to apprehend.

That Arches of Cones *, or Bricks, or Tiles, uſed inſtead of Plates or Plaiſter, will

* A ſort of Pottery, made by Mr. Morris, at Child's Hill, near London :—The advantage ariſing from the uſe

will anſwer the purpoſe, but they are more weighty and expenſive.

That the proper method of applying Mr. Hartley's Plates is as follows: — Garret Story—above the Cieling Joiſts, againſt the Rafters, down to the Flooring Joiſts; over the Joiſts of the Garret Floor, *i. e.* immediately under the Boards, home to the Party Walls, and home to the front and back Walls, turned up againſt the Plates of the Partitions, and againſt the Walls two Inches, and a Flaſhing let into the Wall, and turned down. All the Floors in the ſeveral Stories ſecured in the ſame manner. To ſecure Wooden Staircaſes, the Fire-plates muſt be placed upon the rough

uſe of Cones, when compared with Bricks, is their ſuperior lightneſs, (being twice the bulk and only half the weight), and their being applicable to Arches of a very ſmall riſe.

Steps

Steps and Riſers in ſuch a manner, that the finiſhed Step and Riſer may be ſet cloſe upon them.

That the proper method of applying Lord Stanhope's Invention, or any other wherein is uſed a Compoſition, (in the nature of) Plaiſtering upon Laths; ſuch Compoſition being made of Lime, Sand, Plaiſter of Paris, Brick Rubbiſh, Coal Aſhes, or any other Materials that will form a Cement when mixed with Hair, or chopped Hay, is as follows:—Garret Story—Cieling Floor ſecured *, Rafters inter-ſecured * down to the Flooring. Partitions inter-ſecured; Floors ſecured home to the Party and External Walls; all the Floors in the ſeveral Stories ſecured in the ſame manner. The

* For an Explanation of theſe terms, (ſee Appendix, No. I.)

Wooden Stair-caſes ſecured immediately behind all the Steps and Riſers, and under the flooring of the Landings.

In Buildings that require a more than ordinary degree of ſecurity, the plating, or other means of prevention, muſt be doubled; in which caſe the Committee are warranted to ſay, that it will effectually reſiſt the ſtrongeſt Fire.

That Mr. Wood's compoſition, being a liquid, may be advantageouſly applied to the Backs of Wainſcot Linings, Skirtings, Grounds, &c. in the manner of paint.

III. Laſtly, as to the means by which preventions from Fire may be brought into general practice.

1. The

1. The Committee are of opinion, that this deſirable end would moſt effectually be obtained by the Authority of Parliament over new Buildings, and Buildings that are altering or repairing, as is the caſe with reſpect to Party Walls.

2. By regulating the mode of Inſurance at the Fire Offices, on Buildings, Furniture, and Stock in Trade.

3. By rendering the opinion of the Aſſociated Architects public.

At any rate, the Committee earneſtly recommend to the Society, to whom they make this report, the moſt unremitting endeavours to enforce and facilitate a practice certain in its principles, and which has for its object the ſecurity

of Life and Property. The number of lives loſt * within a few years; the immenſe property in great manufactures, and public and private buildings, deſtroyed by accident, or by Incendiaries (ſome of whom have been executed for the crime†) forms a melancholy catalogue, more than ſufficient to call into action the exertions of Men, in the practice of a liberal Profeſſion.

By Order of the Committee,

HENRY HOLLAND.

London,
January 3d, 1793.

* The number of lives loſt in one year (1792) as collected from the Daily Advertiſer only, is 23; the number of Fires 64.

† About two years ago, two men were executed in Alderſgate Street, for ſetting fire to Mr. Gilding's houſe; and about a year previous to that, a man was executed for the like offence in Great Pulteney Street. A man's ſetting fire to his own houſe is a miſdemeanour only; many caſes of that kind have occurred.

APPENDIX.

APPENDIX.

No. I.

DESCRIPTION

OF A MOST EFFECTUAL METHOD OF SECURING

BUILDINGS

AGAINST

FIRE.

INVENTED BY

CHARLES LORD VISCOUNT MAHON,

(Now EARL of STANHOPE,) F. R. S.

[From PHILOSOPHICAL TRANSACTIONS, Vol. 68, Part II.]

Read JULY 2d, 1778.

§ 1. THE new and very ſimple method which I have diſcovered of ſecuring every kind of Building, (even though

though conſtructed of timber) againſt all danger of Fire, may very properly be divided into three parts: namely, *underflooring*, *extra lathing*, and *inter-ſecuring*, which particular Methods may be applied in part or in whole to different Buildings, according to the various circumſtances attending their conſtruction, and according to the degree of accumulated Fire to which each of theſe Buildings may be expoſed, from the different uſes to which they are meant to be appropriated.

§ 2. The method of *underflooring* may be divided into two parts, viz. into *ſingle* and *double underflooring*.

The method of ſingle underflooring is as follows:—A common ſtrong lath, of about one quarter of an inch thick, (either of oak or fir), ſhould be nailed againſt

againſt each ſide of every joiſt, and of every main timber which ſupports the floor intended to be ſecured. Other ſimilar laths ought then to be nailed the whole length of the joiſts, with their ends butting againſt each other: theſe are what I call *fillets*. The top of each fillet ought to be one inch and a half below the top of the joiſts or timbers againſt which they are nailed. Theſe fillets will then form, as it were, a ſort of ſmall ledge on each ſide of all the joiſts.

§3. When the fillets are going to be nailed on, ſome of the rough plaiſter, hereafter mentioned, (§9,) muſt be ſpread with a trowel all along that ſide of each of the fillets which is to lay next the joiſts, in order that theſe fillets may be well bedded therein when they are nailed on, ſo that there ſhould not be

 any

any interval between the fillets and the joiſts.

§4. A great number of any common laths (either oak or fir) muſt be cut nearly to the length of the width of the interval between the joiſts.

Some of the rough plaiſter referred to, above, (§3,) ought to be ſpread with a trowel ſucceſſively upon the top of all the fillets, and along the ſides of that part of the joiſts which is between the top of the fillets and the upper edge of the joiſts.

The ſhort pieces of common laths, juſt mentioned, ought (in order to fill up the intervals between the joiſts that ſupport the floor) to be laid in the contrary direction to the joiſts, and cloſe together in a row, ſo as to touch one another

another, as much as the want of ſtraitneſs in the laths will allow, without the laths lapping over each other; their ends muſt reſt on the fillets ſpoken of above, (§ 2), and they ought to be well bedded in the rough plaiſter. It is not proper to uſe any nails to faſten down either of theſe ſhort pieces of laths, or thoſe ſhort pieces hereafter mentioned, (§ 7.)

§5. Theſe ſhort pieces of laths ought then to be covered with one thick coat of the rough plaiſter, ſpoken of hereafter, (§ 9,) which ſhould be ſpread all over them, and which ſhould be brought with a trowel, to be about level with the tops of the joiſts, but not above them. This rough plaiſter in a day or two ſhould be trowelled all over, cloſe home to the ſides of the joiſts; but the tops of the joiſts ought not to be in anywiſe covered with it.

§6. The

§6. The method of *double under-flooring* is in the firſt part of it exactly the ſame as the method juſt deſcribed. The fillets and ſhort pieces of laths are applied in the ſame manner; but the coat of rough plaiſter ought to be little more than half as thick as the coat of rough plaiſter applied in the method of *ſingle under-flooring*.

§7. In the method of *double under-flooring*, as faſt as this coat of rough plaiſter is laid on, ſome more of the ſhort pieces of laths, cut as above deſcribed, (§4.) muſt be laid in the intervals between the joiſts, upon the firſt coat of rough plaiſter; and each of theſe ſhort laths muſt be, one after the other, bedded deep and quite ſound into the rough plaiſter whilſt it is ſoft. Theſe ſhort pieces of laths ſhould be laid alſo as cloſe as poſſible to one another, and in the

the ſame direction as the firſt layer of ſhort laths.

§8. A coat of the ſame kind of rough plaiſter ſhould then be ſpread over the ſecond layer of ſhort laths, as there was upon the firſt layer, above deſcribed. This coat of rough plaiſter ſhould (as above directed § 5, for the method of *ſingle under-flooring*) be trowelled level with the tops of the joiſts, but it ought not to riſe above them. The ſooner this ſecond coat of rough plaiſter is ſpread upon the ſecond layer of ſhort laths, juſt mentioned, (§7) the better.

What follows as far as §13, is common to the method of *ſingle*, as well as *double under-flooring*.

§9.

§9. Common coarſe lime and hair (ſuch as generally ſerves for the pricking-up coat in plaiſtering), may be uſed for all the purpoſes before or hereafter mentioned; but it is conſiderably cheaper, and even much better, in all theſe caſes, to make uſe of *hay*, inſtead of *hair*, in order to prevent the plaiſterwork from cracking. The hay ought to be chopped to about three inches in length, but no ſhorter.

One meaſure of common rough *ſand*, two meaſures of ſlacked *lime*, and three meaſures (but not leſs) of chopped *hay*, will prove in general a very good proportion, when ſufficiently beat up together in the manner of common mortar. The hay muſt be well dragged in this kind of rough plaiſter, and well intermixed with it, but the hay ought never

never to be put in, till the two other ingredients are well beat up together with water.

This rough plaiſter ought never to be made thin for any of the work mentioned in this paper. The ſtiffer it is, the better, provided it be not too dry to be ſpread properly upon the laths.

If the flooring boards are required to be laid very ſoon, a fourth or a fifth part of quick lime* in powder, very well mixed with this rough plaiſter juſt

* I have practiſed this method in an extenſive work with great advantage. In *three weeks* this rough plaiſter grows perfectly *dry*. The rough plaiſter, ſo made, may be applied at all times of the year with great ſucceſs. The eaſieſt method, by much, of reducing the *quick lime* to powder, is by dropping a ſmall quantity of water on the lime-ſtone, a little before the powder is intended to be uſed: the lime will ſtill retain a very ſufficient degree of heat.

before it is uſed, will cauſe it to dry very faſt.

§10. When the rough plaiſter-work between the joiſts has got thoroughly dry, it ought to be obſerved, whether or not, there be any ſmall cracks in it, particularly next to the joiſts. If there be any, they ought to be waſhed over with a bruſh, wet with *mortar waſh*, which will effectually cloſe them; but there will never be any cracks at all, if the *chopped hay* and *quick lime* be properly made uſe of.

§11. The mortar-waſh I make uſe of is this; about two meaſures of quick lime, and one meaſure of common ſand, ſhould be put into a pail, and ſhould be well ſtirred up with water, till the water grows very thick, ſo as to be almoſt

almoſt of the conſiſtency of a thin jelly. This waſh, when uſed, will grow dry in a few minutes.

§12. Before the flooring boards are laid, a ſmall quantity of very dry common ſand ſhould be ſtrewed over the rough plaiſter work, but not over the tops of the joiſts. The ſand ſhould be ſtruck ſmooth with a hollow rule, which ought to be about the length of the diſtance from joiſt to joiſt, and of about one eighth of an inch curvature; which rule, paſſing over the ſand in the ſame direction with the joiſts, will cauſe the ſand to lay rather rounding in the middle of the interval between each pair of joiſts.

The flooring boards may then be laid and faſtened down in the uſual man-

ner; but very particular attention muſt be paid to the rough plaiſter work and to the ſand being moſt perfectly dry before the boards are laid, for fear of the *dry rot*, of which however there is no kind of danger when this precaution is made uſe of.

§13. The method of *underflooring*, I have alſo applied with the utmoſt ſucceſs, to a wooden ſtair-caſe. It is made to follow the ſhape of the ſteps, but no ſand is laid upon the rough plaiſter-work in this caſe.

§14. The method of *extra-lathing* may be applied to cieling joiſts, to ſloping roofs, and to wooden partitions. It is ſimply this:

As the laths are going to be nailed on, ſome of the above-mentioned rough plaiſter

plaiſter ought to be ſpread between theſe laths and the joiſts (or other timbers), againſt which theſe laths are to be nailed. The laths ought to be nailed very cloſe to each other.

When either of the ends of any of the laths laps over other laths, it ought to be attended to, that theſe ends be bedded ſound in ſome of the rough plaiſter.

This attention is equally neceſſary for the ſecond layer of laths hereafter mentioned (§ 15.)

§15. This firſt layer of laths ought to be covered with a pretty thick coat of the ſame rough plaiſter ſpoken of above (§ 9). A ſecond layer of laths ought then to be nailed on, each lath being as it is put on well ſqueezed, and bedded

found into the ſoft rough plaiſter. For this reaſon, no more of this firſt coat of rough plaiſter ought to be laid on at a time, than can be immediately followed with the ſecond layer of laths.

The laths of the ſecond layer ought to be laid as cloſe to each other as they can be, to allow of a proper clench for the rough plaiſter.

The laths of the ſecond * layer may then be plaiſtered over with a coat of the ſame kind of rough plaiſter, or it may be plaiſtered over in the uſual manner.

* If a third layer of laths be immediately nailed on, and covered over with a third coat of rough plaiſter, I then call the method *treble-lathing*, but this method of *treble-lathing* can almoſt in no caſe be required.

§16. The

§16. The third method, which is that of *inter-ſecuring*, is very ſimilar in moſt reſpects, to that of *underflooring*; but no ſand is afterwards to be laid upon it. *Inter-ſecuring* is applicable to the ſame parts of a Building, as the method of *extra lathing* juſt deſcribed; but it is not often neceſſary to be made uſe of.

§17. I have made a prodigious number of experiments upon every part of theſe different methods. — I cauſed a wooden Building to be conſtructed at *Chevening*, in *Kent*, in order to perform them in the moſt natural way. The method of *extra lathing* and *double under-ſecuring*, were the only ones made uſe of in that Building.

On the 26th of *September* laſt year, I had the honor to repeat ſome of my experiments

periments before the Preſident and ſome of the Fellows of the Royal Society, the Lord Mayor and Aldermen of the City of London, the Committee of City Lands, ſeveral of the Foreign Miniſters, and a great number of other perſons.

§18. The firſt experiment was to fill the lower room of the Building, (which room was about twenty-ſix feet long, by ſixteen wide) full of ſhavings and faggots, mixed with combuſtibles, and ſet them on fire. The heat was ſo intenſe, that the glaſs of the windows was melted like ſo much common ſealing-wax, and run down in drops; yet the flooring boards of that very room were not burnt through, nor was one of the ſide timbers, flooring joiſts, or cieling joiſts damaged in the ſmalleſt degree; and the perſons who went into the room immediately

over

over the room filled with fire, did not perceive any ill effects from it whatever; even the floor of that room being perfectly cool, during that enormous conflagration immediately underneath.

§19. I then cauſed a kind of wooden Building, (of full fifty feet in length and of three ſtories high in the middle), to be erected quite cloſe to one end of the ſecured wooden houſe. I filled and covered this Building with above eleven hundred large kiln faggots, and ſeveral loads of dry ſhavings, and I ſet this pile on fire.

The height of the flame was no leſs than eighty-ſeven feet perpendicular from the ground, and the graſs upon a bank, at a hundred and fifty feet from the fire, was all ſcorched; yet the ſecured wooden Building, quite contiguous

ous to this vaſt heap of fire, was not at all damaged, except ſome parts of the outer coat of plaiſter work.

This experiment was intended to repreſent a wooden town on fire, and to ſhew how effectually even a wooden Building, if ſecured according to my new method, would ſtop the progreſs of the flames on that ſide, without any aſſiſtance from fire-engines, &c.

§20. The laſt experiment I made that day, was the attempting to burn a wooden ſtair-caſe, ſecured according to my ſimple method of *under-flooring*. The under ſide of the ſtair-caſe was *extra lathed*; ſeveral very large kiln faggots were laid and kindled under the ſtair-caſe, round the ſtairs, and upon the ſteps; this wooden ſtair-caſe, notwithſtanding reſiſted,

reſiſted, as if it had been of fire-ſtone, all the attempts that were made to conſume it.

I have ſince made ſeveral other ſtronger fires upon this ſame ſtair-caſe without having repaired it, having moreover filled the ſame place in which this ſtair-caſe is, entirely with ſhavings and faggots; but the ſtair-caſe is however ſtanding, and is but little damaged.

§21. In moſt houſes it is neceſſary *only to ſecure the floors*; and that according to the method of *ſingle underflooring*, deſcribed above in §2, 3, 4, and 5. The extra expence of it, (all materials included) is only about ninepence per ſquare yard, unleſs there ſhould be particular difficulties attending the execution, in which caſe it will vary a little. When

Quick Lime is made uſe of, the expence is a trifle more.

The extra expence of the method of *extra lathing*, is no more than ſixpence per ſquare yard for the timber, ſide-walls and partitions; but for the cieling, about ninepence per ſquare yard. No *extra lathing* is neceſſary for the generality of Houſes.

§22. I purpoſe giving to the world, before it is very long, a detailed account of many other experiments I have made on this ſubject, and of the various advantages ariſing from my method, with ſeveral particulars relative to the different parts of each of the members above deſcribed, and relative to their joint or ſeparate application to different kinds of Buildings, and to the different conſtituent parts of an Houſe; to which I ſhall

ſhall add a full explanation of the principles upon which they are founded, and the reaſons of their certain and ſurpriſing ſucceſs. In the mean time, I have taken the liberty of troubling the Society with this ſhort account.

No. II.

AN Account of ſeveral Experiments made on two Street Houſes, fitted up as for Habitation, and ſecured by the direction of the Committee, in order to aſcertain the Degree of Security to be derived from the ſeveral Methods put in practice.

Experiments on the Uſe of Fire Plates.

AT a Houſe (No. 10, Hans Place) ſecured according to Mr. HARTLEY's Method.

Auguſt 2d, 1792.

§1. A fierce Fire was lighted forty minutes after two o'clock, in two chimneys

neys in the Baſement Story, the one of them having in it a wooden box ſecured with the fire plates, and the other having the ſame ſort of box not ſecured at all. The Fire having continued one hour, was extinguiſhed.

The inſide boarding of the ſecured box was burnt, and left the plates bare and ſupported by the quarters, which quarters remained good. One of the joiſts under the bottom was partly burnt. The box in the other chimney which had not been ſecured, was totally demoliſhed in forty minutes.

§2. At forty-eight minutes after two o'clock, a fierce Fire was lighted on the floor in the back garret and againſt the aſhlering, both of which had been ſecured. (The cieling underneath was not laid.)

This

This Fire having continued an hour was extinguiſhed, at which time the flame had made its way through the boards, and taken hold of the joiſts underneath the plating. The flooring boards were burnt away in the ſeat of the Fire, leaving the plates quite bare. Upon removing the plating, the foot of the aſhlers and the plates upon which they reſted, appeared charred about twelve inches up.

§3. The ſtair-caſe having been ſecured (*i. e.* a rough ſtair-caſe was firſt formed, which being plated, the finiſhed ſtep and riſer was ſet upon it), a fierce fire was lighted upon the winders at eight minutes paſt four o'clock, and kept burning thirty minutes, and then extinguiſhed.

At

At this time the treads and riſers appeared charred, and one riſer burnt entirely through under the tread of one of the winders. A ſmall corner of the rough tread underneath the plating appeared charred.

October 4th, 1792.

§4. At ten minutes paſt two o'clock, a fierce fire was lighted in the two pair of ſtairs back room, on the floor and in the angle againſt the partition which ſeparates this from the adjoining room; both this and the adjoining room having been previouſly ſecured.

At twenty-five minutes paſt two o'clock, (being a quarter of an hour from the commencement of the fire) the ſkirting was burnt, and the flame extended itſelf through the lath and plaiſter,

plaiſter, and took hold of the foot of one of the quarters, which was in a ſhort time conſumed twelve inches up. At five minutes paſt three o'clock, (being three quarters of an hour) the ſmoke appeared through the plates underneath the flooring. At twenty minutes paſt three o'clock, (being an hour and ten minutes) the fire itſelf appeared through the flooring; and at thirty minutes paſt three o'clock, took hold of a joiſt, but did not continue its courſe long.

From this experiment it appeared, that the plating will prevent a Fire's extending itſelf in a room to any material diſtance.

December 6th, 1792.

§5. In the front garret of the ſame houſe, and in the angle of the room to

the right hand of the door, (the linings and grounds being ſecured and ſtanding on the floor which was alſo ſecured), a fierce fire of charcoal was made againſt the linings of the door, at half paſt twelve o'clock.

At a quarter before two o'clock, the bottom plate of the partition was conſumed, and the fire had caught two of the joiſts underneath and charred them in a ſmall degree. At ten minutes paſt two o'clock the fire was put out, when it appeared that the upper plate of the partition of the ſtory underneath was on fire; the grounds and linings were conſumed about eighteen inches high, *(i. e.)* as high as it was in contact with the fuel; the flame had aſcended between the lathing on each ſide of the partition and charred the quarterings to the top,

where

where it appeared to have been ſtopped in its courſe by the plates.

§6. On the ſame day, and in the ſame houſe, an experiment was made in the back parlour, which was ſecured ſo as to reſiſt the ſtrongeſt fire. The floor was double armed, (*i. e.* the cieling underneath plated and plaiſtered, ſcreened dry rubbiſh laid three inches deep upon the plating, then ſound boarded, and filled level with the joiſts with rubbiſh; the plating laid again, and the flooring boards laid immediately upon it, the floor above was treated in the ſame manner; the partitions bricknogged, and plated on each ſide, then battened out to receive the lath and plaiſter; a dado fixed on the partition ſide of the room, and prepared at the back with Mr. Wood's compoſition;

the jaumbs, cill, and outſide ſhutter of the window plated, the door hung and double ſecured, and the chimney blocked up.

N. B. This room was fitted up from the directions of Mr. HARTLEY, by his foreman, Knight.

At a quarter paſt one o'clock, a very fierce fire was made with a tar barrel, pitch boards, and other combuſtible matter, and kept up by additional fuel, till a quarter paſt two o'clock, ſo as to produce a very powerful conflagration, that occupied the whole room, (in the ſame manner as in the Experiment made by Mr. Hartley, at his Experiment Houſe, on Wimbledon Common, and which he calls his Magazine Experiment). When the outſide ſhutter was cloſed, it appeared to affect the flames,

ſo

ſo as to abate them conſiderably; at that ſame time the plaiſtering of the cieling fell, and the inſide of the door was conſumed, ſo as to expoſe the plating to the flames, which however remained whole and entire. At half paſt two o'clock the flames appeared on the outſide of the door, through the rebate at the head. At five minutes before three o'clock, the ſhutter was again cloſed, with a view to extinguiſh the fire; the ſmoke of it appearing through the brick-walls, induced the Committee to ſuppoſe that the bond timbers, lintels, and plates, would be conſumed. At a quarter paſt three o'clock, the flames were got under, and the aſhes and unconſumed fuel cleared out of the room; when it appeared, that the flooring boards were burnt through in the ſeat of the fire, in other places only charred:— the dado was entirely gone, and the battening

tening upon the fire plates to which the laths were nailed, very much charred, as well to the ſides as the cieling. Upon taking off the plating it appeared, that the quarterings of the partition were in a good ſtate, but in a few places the fire had charred them, ſo as to change their colour only. The wood-bricks were alſo charred half an inch deep in general; the lintel of the window did not prove to have been injured, nor the door-caſe. The bottom plates of the partition remained entire. Upon removing the boards the trimmer appeared to have been burnt for a foot in length by half its depth:—ſome others appeared charred. The adjoining rooms, and the wooden ſtairs, which were only ſeparated from this room by wooden partitions, were not at all affected during the whole experiment.

Experiments

Experiments on the Security to be derived from the Uſe of PLAISTER.

THE Houſe, (No. 5, HANS TOWN), on which theſe Experiments were made, was ſecured by plaiſter, in great meaſure, from the directions given by Lord STANHOPE, in his Paper read to the Royal Society: The plaiſter made uſe of being compoſed of ſcreened rubbiſh, coal-aſhes, brick-duſt, a ſmall proportion of quick-lime, and chopped hay.

Auguſt 2*d*, 1792.

§7. At forty minutes after two o'clock, a fierce fire was lighted on the flooring boards and againſt the aſhlering in the front garret, which had been ſecured

ſecured and finiſhed as uſual for habitation; the fire was kept up by a continual accumulation of fuel till forty minutes after three o'clock, when it was extinguiſhed.

At this time the ſkirting board was burnt through as far as the fire or fuel was in contact with it, but no farther; the flooring boards for the ſame extent were charred nearly through, and one piece of quarter in the aſhlering was charred; but there was no appearance which could give the Committee reaſon to ſuppoſe, that the fire would have ſpread had it not been extinguiſhed.

§ 8. At the ſame time a fierce fire was lighted on the floor in the back garret and againſt the aſhlering, (both of which had been ſecured, and the room completely finiſhed),

finiſhed) and kept burning for the ſame length of time.

The effect of this was nearly the ſame with that of the fore-mentioned and co-temporary fire. In the ſeat of the fire, which was kept up very ſtrong by additional fuel, the flooring boards were charred conſiderably; the plaiſtering of the room gave way; the ſkirting board being burnt, the quarters of the aſhlering were expoſed and damaged, but there was no reaſon to conclude that the fire would have ſpread, had it been permitted to go on of itſelf. Note.—In theſe two Experiments, the cielings underneath were not laid.

§ 9. On the ſame day an Experiment was made on the ſtair-caſe, which was ſecured with plaiſter following the ſteps and riſers, and the ſtairs were finiſhed

for uſe. The ſtring underneath was not laid.

A fierce fire was lighted at fifty minutes paſt three o'clock, and kept up till twenty minutes paſt four o'clock; this fire covered the whole of the firſt flight, up to the garret.

Upon extinguiſhing the fire it appeared, that the riſers and treads were conſiderably charred in the ſeat of the fire, but there was no reaſon to ſuppoſe, that the fire would have ſpread to any material extent, had it not been put out. The plaiſter remained uninjured.

October 4th, 1792.

§ 10. An experiment was made in the back room, which was ſecured with plaiſter and finiſhed. A fierce fire was lighted

lighted at two o'clock on the floor, and againſt the partition which ſeparates this from the adjoining room, and kept up till three quarters paſt three o'clock; during which time, freſh fuel was continually added. (The cieling underneath was not laid.)

At the expiration of half an hour, no damage appeared; but at the end of the hour and three quarters, the Fire made its way through the floor, and conſumed part of the joiſts immediately under it; three of the quarters were much charred, the plaiſtering of the partition gave way, and, the quarters behind being expoſed, the fire was ſeen extending itſelf up them. In this experiment however, as in the others, it did not appear probable that the Fire, left to itſelf, and not extinguiſhed,

would have ſpread ſo as to be of any conſequence.

December 26th, 1792.

§11. An excellent and convincing experiment was made in the one pair of ſtairs back room. The room was completely finiſhed, fit for habitation; the cieling of the room underneath was finiſhed, which had not been the caſe in any former experiment, and which, as it admits air to the underſide of the Fire, was conceived a diſadvantage. The partition between the rooms was interſecured, and alſo the floor and cieling. At half paſt twelve o'clock, a large ſtrong charcoal Fire was made on the flooring boards, clear of the ſides of the room, and continued till four o'clock. At forty-five minutes paſt two o'clock, a large additional wood Fire

was

was made in the angle of the room next the partition, both Fires were kept up by a conſtant accumulation of fuel, ſo as to render them exceedingly fierce.

In the ſeat of the charcoal Fire, the flooring boards were burnt through, and two of the joiſts damaged two inches deep. With reſpect to the angle Fire, that part of the floor and ſkirting which was immediately contiguous to it, was much damaged; two of the quarters were charred fifteen inches up; the plate of the partition and the bond timber was ſlightly charred.

§12. An experiment was made, to reſiſt the ſtrongeſt Fire in the back parlour, which was doubly ſecured for that purpoſe; the floor, ſides, and cieling with plaiſter, the door and window ſhutter with Fire-plates.

At

At forty-five minutes after eleven o'clock, a fierce Fire was made with a tar barrel, pitch boards, and other combuſtible matter, ſo as to occupy the whole room; in a manner ſomething ſimilar to that deſcribed by Lord STANHOPE, in his paper read to the Royal Society: freſh fuel was continually added, and the fire remained in the ſame ſtate till one o'clock, at which time the ſhutter was cloſed. By this the Fire was choaked, but continued to ſmother on till half an hour after two; when it appeared, that the flooring boards were charred conſiderably, the cieling and plaiſtering had given way, the joiſts and timbers which became expoſed thereby were charred, but the rooms adjoining, and the wooden ſtaircaſe, which were ſeparated only by wooden partitions, were not at all affected during the whole experiment.

Experiments

Experiments on the ſecurity to be derived from the uſe of a Liquid Covering.

At a houſe, (No. 5, Hans Place) ſome experiments were made in order to aſcertain the degree of ſecurity to be derived from the uſe of Mr. WOOD's compoſition.

Auguſt 2d, 1792.

§13. At forty-five minutes after two o'clock, a fierce Fire was lighted in two chimneys on the Baſement Story, one of them having in it a wooden box ſecured with the compoſition, and the other having the ſame ſort of box, not ſecured at all.

The

The Fire having continued one hour, was put out, at which time the back and ſeveral other parts of the ſecured box were burnt, but the quarterings very little damaged: the compoſition remained perfect after the boards were conſumed. The box that had not been ſecured was totally demoliſhed in forty minutes.

October 4th, 1792.

§14. Another experiment was made on the ſame principle, and of which the reſult was nearly the ſame as before; both the compoſition and outſide quartering remained.

§15. Another experiment was made in order to aſcertain the efficacy of the compoſition on the lower flight of ſteps to which it had been applied. A fierce

Fire

Fire was lighted at two o'clock underneath the ſtairs, (the ſtring not being plaiſtered) and continued for one hour. When it was extinguiſhed, one of the ſtrings appeared a little charred, but the compoſition remained in a perfect ſtate, excepting only that its colour was changed.

§16. At three o'clock a fierce Fire was lighted upon the ſteps and riſers of the ſame ſtaircaſe, and over the place, where the Fire laſt mentioned had been made. This Fire, having burnt rapidly for half an hour, appeared through the underſide, and in half an hour longer, the ſteps and riſers were totally conſumed. The compoſition however remained on the underſide. The Fire did not incline to extend itſelf.

December 6th, 1792.

§17. An experiment was made on the ſame ſtaircaſe, in order to aſcertain what reſiſtance the compoſition would effect, when a nail was driven through ſome of the timber, or remaining ſteps and riſers of the ſtairs. Upon trial, the compoſition broke off, on the underſide of the treads of the ſtaircaſe. This however ſeemed to be owing to the vibration produced by walking up and down the ſtaircaſe, rather than to the force of the nails being driven through them. A board, on which the compoſition was laid, had ſeveral nails driven through it, when the compoſition neither cracked, nor pealed off.

§18. On the ſame day, an experiment was made in order to aſcertain the ſecurity to be derived from Mr. Wood's method, when applied to the back of linings

linings and grounds, ſtanding on the floor, ſecured with plaiſter: being a joint experiment of plaiſter and liquid ſecurity.

At thirty minutes after twelve o'clock a charcoal Fire was made in the angle of the front garret, againſt the jaumb of the door.—At thirty minutes after one o'clock the ſkirting was conſumed, where the body of the fire lay, and wãs then probably ſtopped by the compoſition at the back of it.—At thirty minutes after two o'clock the Fire was extinguiſhed, when it appeared to have made its way through the flooring boards, taken hold of a joiſt, and charred it to a ſmall extent: It had alſo burnt a board which was fixed between the joiſts and wall, to ſupport the ſecurity inſtead of laths.

Upon

Upon taking off the jaumb lining, Mr. Wood's compoſition appeared to have prevented the Fire from extending itſelf; the flooring boards were conſumed only in the ſeat of the Fire. The quarterings of the partition were charred, and the bottom plate alſo, but in a leſs degree.

Upon the whole, this Experiment anſwered; proving that a Fire will not extend itſelf, although begun with Charcoal for the purpoſe, and although the Charcoal continues a ſtrong fire for two hours.

FINIS.

*** The Committee have in the courſe of their Enquiry been much aſſiſted by Mr. HANSON, of Bruton Street, in the application of the Fire-plates invented by Mr. HARTLEY: by Mr. ROTHWELL, of Sloane Street, in the application of the Plaiſter Security: and by Mr. HENRY WOOD, of Sloane Square, in the application of his Liquid Security.

They alſo feel themſelves under great obligations to Mr. RICHARD HOLLAND, of Half Moon Street, who with the utmoſt confidence lent two new Houſes to be ſubjected to the ſeveral Experiments that have been made.

MVSEVM
BRITAN
NICVM